DRAWN BY: C.P. TURNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE FLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

SHEET CONTENTS

TITLE SHEET

PROFILE SITE PLAN LEGEND

5-6 7

BORE LOGS

SCOUR REPORT

SOIL TEST RESULTS

DESCRIPTION

PROJ. REFERENCE NO. 45299.1.1 (B-5201) BEAUFORT

PROJECT DESCRIPTION BRIDGE NO. 33 ON AT -L- STA. 16+02.50

NC 99 OVER CANAL

_ F.A. PROJ. BRSTP-0099(8)

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS OF NORTH CAROLINA

STATE

GEOTECHNICAL ENGINEERING UNIT

STRUCTURE

INVESTIGATION

CAUTION NOTICE

N.C.

STATE PROJECT

REFERENCE NO.

SHEET TOTAL

B-5201

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANING, AND ESSIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARROUS FIELD BORRIS LOSS, ROCK CORES, AND SOL TEST DATA VARIABLE MAY BE REVERED OR INSPECTED IN RALEGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL BOWNERSHOW BY THE THE SUBSURFACE PLANS AND REPORTS, NOR THE FELD BORRIS LOSS, ROCK CORES, OR SOL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRAIA DESCRIPTIONS AND NUCLATED BOUNDARIES ARE BASED ON AT GEORGENICAL INTERPRETATION OF ALL AVAILABLE. SUBSURFACE DATA AND MAY NOT RECESSARLY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN SORMAS ON BETWEEN SAMPLED STRAIA WITHIN THE BORDHOLE, THE LABORATORY SAMPEE DATA AND THE SITU ON-PLACED TEST DATA CAN BE RELED ON ONLY TO THE DESCRIPT OF SELECULITY INVERSING IN THE STANDARD TEST METHOD. A CAN BE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION, THESE WATER LEVELS OR SOL MOISTURE CONDITIONS MAY LARY CONSIDERABLY WITH THE ACCORDING TO CUMATIC CONSTITUNTS INCLUDING TEMPERATURES, PRECENTATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BODER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MAIN CASES THE FIRAL DESIGN DETAILS ARE DIFFERENT; FOR BODING AND CONSTRUCTION PURPOSES, DEFERT OT THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN MEGNATION ON THIS PROJECT, THE DEPARTMENT DOES NOT WARRANT OR CULRACTY OF THE INVESTIGATION MADE, AND THE INTERPETATIONS ALED, OR OPINION OF THE DEPARTMENT OF CAUTIONED TO MAKE SUCH MODEPOINT SUBSURFACE INVESTIGATIONS AS THE DEEMS RECEISARY TO SATISTY MASSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FIRM FOR THE FORM THE SATION ADDITIONAL COMPENSATION OF FIRM FOR THE FORM THE SATION OF THE SATION OF THE SATION OF THE SATION AND THE SUBSURFACE RECONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FIRM FOR THE FORM THE SATION OF THE

PERSONNEL

FLORENCE & HUTCHESON, INC.

INVESTIGATED BY T.C. BOTTOMS

SUBMITTED BY. D.N. ARGENBRIGHT D.N. ARGENBRIGHT

VOVEMBER 2010

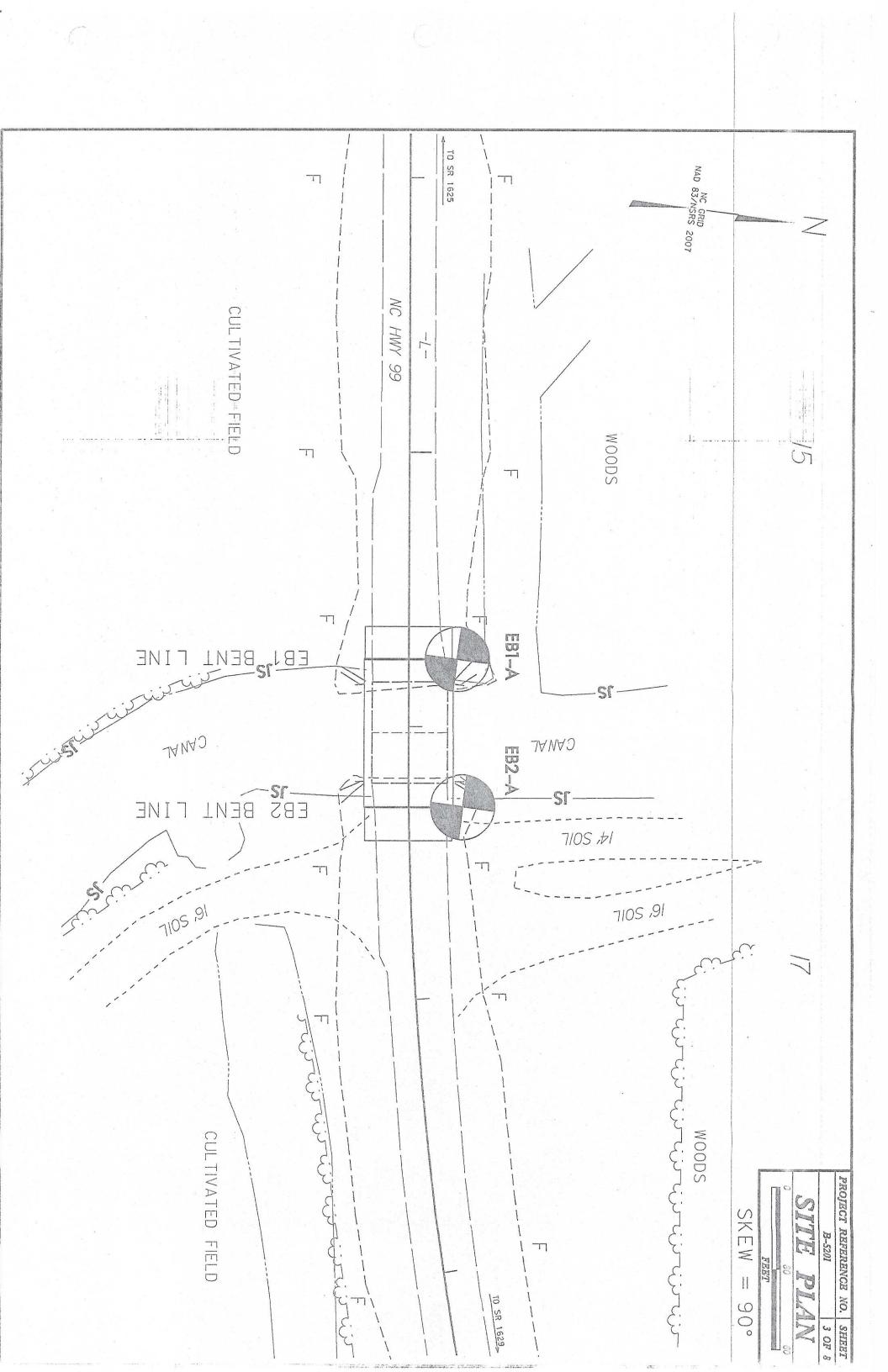
DATE

1//29/10 SET AL CAR OF THE STATE OF THE

LASTIC RANGE . NONPLASTICITY HED, PLASTICITY HIGH PLASTICITY DPENING (MM) GROUP INDEX 8 USUAL TYPES STONE FRACS. OF MAJOR GRAYEL, AND SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR VEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POVER AUGER, AND YELD LESS THAN 180 BLOWS PER FOOT ACCREDING TO STRONGAR PENETRATION TEST (ASAPTIO T208, ASTIN 1-1580). SOIL CASSIFICATION IS BASED ON THE ABSTID SYSTEM, BASED DESCRIPTIONS GENERALLY SHALL INCLUDE, CONSISTENCY, COOR TEXTURE, MUSTURE ABSTID LEASTFORTIONS, GENERALLY SHALL INCLUDE, CONSISTENCY COOR TEXTURE, MUSTURE AS TO LEASTFORTION AND DIFFER PERTITIENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ASOLIARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: GRAIN SYMBOL DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAM, RED, YELLOW-BROWN, BLUE-GRAY). YOUNTERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. PRIMARY SOIL BOULDER (NON-COHESIVE) GENERALLY SILT-CLAY MATERIAL (COHESIVE) GENERALLY PL SOIL MOISTURE SCALE SE. PI OF A-7-5 SUBGROUP IS ≤ LL -芝蓬 38 HX 58 HX 8 OPTIMUM MOISTURE SHRINKAGE LIMIT 6 MX 305 PLASTIC LIMIT LIGUID LIMIT TYPE GRANULAR MATERIALS (≤35% PASSING *200) EXCELLENT TO GOOD SOIL LEGEND AND AASHTO CLASSIFICATION YER STAF, BOW, SUTY CLA, WIST WITH WITEREDED FINE SHID LIVERS, HIS WIT PLISTIC, 1-7-6 등 등 등 등 ₹ COMPACTNESS OR CONSISTENCY VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD 3 40 HX 41 HN 40 HX 41 HN 40 HX 41 HN 40 HX 41 HN HN 11 HN SILTY OR CLAYEY GRAVEL AND SAND GRAVEL 4.76 PLASTICITY INDEX FIELD MOISTURE DESCRIPTION SATURATED -(SAT.) 4 HX 0-5 6-15 16-26 26 OR MORE MOIST - (M) PLASTICITY DRY - (D) 2.88 WET - (W) 30 :PI OF A-7-5 SUBGROUP IS > LL - 30 CY OR DENSENESS CHARGE OF UNCOMPRESSIVE SIR PENETRATION RESISTENCE COMPRESSIVE SIR COLOR 8 HX 12 HX 16 HX H0 HX CDARSE SAND (CSE, SD.) A-4 SILTY 48 8.42 13 00 4 N 30 FAIR TO POOR P-0 PI 10 4 10 15 10 38 10 38 74 T0 10 T0 30 T0 50 750 60 0.25 GUIDE FOR FIELD MOISTURE DESCRIPTION REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE SEMISOLID; REDUIRES DRYING TO ATTAIN OPTIMUM MOISTURE USUALLY LIQUID, VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE CLAYEY SOLID; AT OR NEAR OPTIMUM MOISTURE 200 SAND SAND A-1, A-2 A-3 GRANULAR SDILS FAIR TO POOR DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²) 278 9.053 SOILS WITH LITTLE DR MODERATE AMDUNTS OF ORGANIC 0.05 DRGANIC MATERIALS 0.25 0.5 1 SILT A-4, A-5 A-6, A-7 SILT-CLAY SOILS (0.25 5 TO 0.50 5 TO 1.0 7 TO 2 7 TO 4 5 4 POOR N/A 0.005 (CL) HIGHLY ORGANIC SOILS PEAT TRACE OF ORGANIC MATTER LITTLE OFGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC AR - AUGER REFUSAL BI - BORING TERMINATED CL. - CLAY CPT - COME PENETRATION TEST CSE. - CDARSE KINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. 中田田田田本 WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARD UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE, ALSO PROBLY BRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES, ANGULARITY OR ROUNDNESS OF BOIL GRAINS IS DESIGNATED BY THE TERMS, ANGULAR, THE ANGULARITY OR ROUNDNESS OF BOIL GRAINS IS DESIGNATED BY THE TERMS, ANGULAR, 111=111= - BK-51 × Д. DRILL FRAC. FRACTURED, FRA F - FINE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST VPW - Indiana Q P P 4 ORGANIC MATERIAL CME-45C CME-558 ANGULARITY OR ROUNDNESS OF SOIL GRAINS NGULAR, SUBROUNDED, OR ROUNDED. MOBILE 8-[201] SINU. 71. Sur: (** PORTABLE HOIST - FRAGMENTS DIP & DIP DIRECTION OF RDCK STRUCTURES ALLUVIAL SOIL BOUNDARY INFERRED ROCK LINE INFERRED SOIL BOUNDARY SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SPRING OR SEEP STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING SOILS 2 - 3% 3 - 5% 5 - 10% YIO% \times \times ADVANCING TOOLS: TRICONE TRICONE 2 15/16 STEEL TEETH TUNG,-CARBIDE INSERTS CLAY BITS MED. - MEDIUM MICA, MICAGEOUS MICA, MICAGETELY MICA, MICAGETELY MICAGETELY MICAGETEL M CORE BIT CASING HARD FACED FINGER BITS 8" HOLLOW AUGERS 6 CONTINUOUS FLIGHT AUGER USED ON SUBJECT COMPRESSIBILITY ABBREVIATIONS GROUND WATER 50ILS 3 - 5% 5 - 12% 12 - 20% >20% SOIL W/ ADVANCER O OPT DAT TEST BORING 0 \oplus NORTH CAROLINA DEPARTMENT OF TRANSPORTATION AND * TUNE -CARB. PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SOUNDING ROD CONE PENETROMETER TEST MONITORING WELL CORE BORING AUGER BORING MATERIAL SUBSURFACE ROCK LIMIT LESS THAN LIMIT EQUAL TO 3 LIMIT GREATER TH OTHER MATERIAL TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND GEOTECHNICAL ENGINEERING X AUTOMATIC CORE SIZE: SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - 9HELBY TUBE RS - HOCK RT - PECONPACTED TRIANIAL HAMMER TYPE: VST - VANE SHEAR TEST WEA. - WEATHERED Y - UNIT WEIGHT Y_- DRY UNIT WEIGHT LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS CBR - CALIFORNIA BEARING RATIO ANGULAR, HAND AUGER 1 - 18% 10 - 28% 20 - 35% 35% AND A POST HOLE DIGGER VANE SHEAR TEST SOUNDING ROD DIVISION OF HIGHWAYS TEST BORING W/ CORE SPT REFUSAL SPT N-VALUE MANUAL INVESTIGATION SEDIMENTARY ROCK (CP) MODERATELY SEVERE (MOD. SEV.) VERY SLIGHT VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, VITE MOVEY FRACHENTS OF STRONG ROCK FERMANING, SAPPLUTE IS AN EXAMPLE OF POCK MEATHERED TO A DEGREE SUCH THAT ONLY YINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, VIELDS SPT N VILLES < 100 BPF SEVERE (SEV.) RTICHI SETICHI MODERATE ROCK (CR) WEATHERED ROCK (WR) MODERATELY HARD NON-CRYSTALLINE MEDIUM HARD OMPLETE FRESH HARD VERY HARD HARD BOCK IS NOW-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD WELD SPT REFUSAL, AN BOCK LINE INDICATES THE LEVEL AT WHICH MON-COASTAL PLAIN MATERIAL WOULD WIELD SPT SPT REFUSAL IS PERITARIAND BY A SCULT SCON SAMPLER BOUNG, TO BY LESS THAN BAT FOOL IN NOW-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPREDE WHITE PROCESS THAT WAS A PROCEDULAR TO BY THE PROCESS THAT WAS A PROCEDULAR TO BY THE PROCESS THAT WAS A PROCES SOFT TERM VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE SEDIMENTARY ROCKS, INDURATED EXTREMELY INDURATED MODERATELY INDURATED ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE. ALL ROCK EXCEPT QUARTZ DISCOLDRED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINZED TO SOME EXTENT, SOME FRANKENIS OF STRING ROCK USUALLY REMAIN. JE TESTED, VIELDS, SPT. N. VALUES, > 180, EPF. ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK GHOWS SEVERE LOSS OF STRENGTH AND CAN EE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES 'CLUKK' SOUND WHEN STRUCK, IF TESTED, NOW, O YIELD SPT. REFUSAL SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND MEATHERING EFFECTS. GRANITIOD BOCKS, MOST FELOSFARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. DULL SOMPO UNDER HERMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH A MITH FRESH ROCK. ROCK GERFALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAWMER BLOWS IF OF A CRYSTALLINE MATURE. ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAWMER IF CRYSTALLINE. ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL F CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER B CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIL OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED TRANSPARM CAN BE GROOVED OR GOUGED 8.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR CAN BE EXCAMATED IN SYMLL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BY POINT OF A GEOLOGIST'S PICK. CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAMATED IN FIRM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. PIECES CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED BY KWIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY HODERATE BLOWS. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REDUIRES SEVERAL HARD BLOWS OF THE GEOLDGIST'S PICK. UNIT INDURATION MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FEET LESS THAN 0.15 FEET FINE TO COARSE BRAIN IDNEOUS AND METAMORPHIC ROCK THAT VOLUD TRED SYT REFUSAL IF TESTED, ROCK TYPE INCLUCES BRANTE, FINE TO COARSE GRAIN WETAMORPHIC AND NON-COASTAL PLAIN ENERT TO COARSE GRAIN WETAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YETLD SYT REFUSAL IF TESTED, ROCK TYPE NOLUDES PHYLLITE, SLATE, SAMOSTOME, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SYT REFUSAL, ROCK TYPE INCLUDES LINESTONE, SAMOSTONE, CEMENTED SHELL BEDS, ETC. SPACING NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES \gt 100 BLONS PER FOOT IF TESTED. THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. SHARP HAMMER BLOWS RECUIRED TO BREAK SAMPL SAMPLE BREAKS ACROSS GRAINS. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL DIFFICULT TO BREAK WITH HAMMER. RUBBING WITH FINGER FREES NUMEROUS GRAINS: GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. VERY THICKLY BEDDED THINKY BEDDED THINKY BEDDED THINKY BEDDED THINKY LAMINATED THINKY LAMINATED 0.03 · 0.03 · 0.03 · 0.03 · 0.03 · 0.03 * 4 FEET - 4 FEET - 1.5 FEET - 0.15 FEET - 0.93 FEET '05 FEET PROBE, OR PICK POINT. PIECES 1 INCH ED READILY BY I FRAGMENTS . IN 7. ROCK HAS AS COMPARED FELDSPAR BLOWS. N INFERRED I REFUSAL. DI PER 60 BLOVS. RESENTED BY A ZONE RESSURE, ETC. KNESS COLLUMUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. NOTES: MOTILED MOTAL- PREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTILING IN SOILS USUALLY INDICATES POOR AFRATION AND LACK OF GOOD ORAINAGE. PERCHED MATER, - WATER MANINAINED ABOVE THE NORMAL GROUND MATER LEVEL BY THE PRESENCE OF AN INTERVENIOUS STRATUM. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SHALL COMPARED TO $\overline{\Pi}S$ LATERAL EXTENT. $\underline{\mathsf{DIP}}$ - THE ANGLE AT WHICH A STRATUH OR ANY FLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. $\underline{\text{DIKE}}$ - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <u>ADUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS ON OR BPF) OF A 140 LB, HAWMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EDUAL TO OR LESS THAM 0.1 FOOT PER 50 BLOWS, SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALDNO A FAULT OR SLIP PLANE. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <u>SAPROLITE (SAP)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FLOAT - ROCK FRAGHENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOCKED FROM PARENT MATERIAL. $\underline{\mathit{FAUL}}$ - a fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture. $\underline{\rm DIP}$ DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AT WAICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE BENCH MARK: BM-I: RR SPIKE IN BASE OF 16" GUM AT -BL- STA. 11+44, 123' RT STRATA ROCK QUALITY DESIGNATION (SROC):- A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGNENTS EDUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. IDESOIL (151 - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN DIRE OR MORE DIRECTIONS. ERMS AND DEFINITIONS PROJECT B-5201 S ELEVATION: 10.27 2 OF 8 SHEET NO.

ia.

er i filia



<u>-75</u>	0 15:07 penyule Inves- AT GE52483	6	-60	Gr.	071	45	40	6	6	25	-20	I made	0	J.	0	O1	ਰ	on on	20	N
					MEDIUM											1	mand to the control of the control o		70	
	(35)	34	(28)	(22)	DE	29	(8)	A	(9)	4)	(24)	VERY LOOSE TO VERY DENSE GRAY	(b)	(HOW)	6	MOIST (ROADWAY EMBANKMENT)	EDIUM-DENSE-BROWN-SAND,		T O G	- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
					WITH SHELL FRAGMENTS.	29	23	- (J)		48	59	AND BROWN SAND, MOIST TO		WOH	WATER SURFACE 5/10			+75	ORIZOS PROJEC	
					SATURATED (YORKTOWN FORMAT	00000					0000	SATURATED (UNDIVIDED COASTAL				MOIST (ROADWAY EMBANKMENT)	\$0.00 man	EB2-A 16+30 7071 T	ALOZO L	
	NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.	NOTE: GROUNDLINE PROFILE ALONG LL TAKEN FROM BRIDGE SURVEY & HYDRAULIC REPORT DATED 9/21/10.			TION)							TAL PLAIN)				MENT)	VE=2.0		(Ca)	B-5201
G (mm	70	Č.	-60	-55	-50	25	40		-30	-25	-20		-10	6	0	On	0 10	PLANS	HYDRAULICS ENGINEER PLANS	4 OF 8

-63.0 73.7 14 17 17	GEO -53.0 63.7 10 10 12	-45	-38.0 48.7 9 8 10 -43.0 53.7	-28.0 38.7 5 10 9	-20 -230 -230 -230 -230 -231 14 17 24	2 7	3 3	20 87 2 3 3 \$\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	5 70 37 5 1 1 22		VE DEPTH BLOW COUNT (ft) 0.5ft 0.5ft 0.5	DRILLER GOWER SONNY START DATE		STATION	PROJECT NO. 45299.1.1 ID. B-5201	
	228				41						BLOWS PER FOOT	92% 05/19/2009 COMP.		+75		
SS-1	SS-17		and the property of the same of	SS-14	SS-13	SS-12	P		9 8-28 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		SAMP. L O NO. MOI G E	DATE: 11/06/10 Mud	689,669	18 ft LT	BEAUFORT	
GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)				GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION) 42.0		22.0			ROADWAY EMBANKMENT BROWN SAND, MOIST UNDIVIDED COASTAL PLAIN GRAY AND BROWN SAND, MOIST TO SATURATED	GROUND SURFACE	SOIL AND ROCK D	Rotary HAMMER TYPE Automatic	ING 2,702,063 24 HR.	ALIGNMENT -L- 0 HR, N/A	GEOLOGIST FLORENCE & HUTCHESON	The first control of the control of
-1445	46 35	-125	-120	0	-100	95	90 85		-75	-65 Mat	ELEV	F&H04	COLLAR ELEV. 10.7 ft	BORING NO. EB1-A STATION 15+75	PROJECT NO. 45299.1.1 ID. B-5201	the control of the co
											75 100	DRILL METHOD	Flore	OFFSET 18ftLT	COUNTY BEAUFORT	
									80.2 Boring Terminated at Elevation -69.5 ft In Dense Sand	GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)	SOIL AND ROCK DESCRIPTION	Mud Rotary HAMMER TYPE Automatic	,702,063 24 HR.	ALIGNMENT -L- 0 HR. N/A	GEOLOGIST FLORENCE & HUTCHESON	

-65	DOT BOK	-68	ģ	-50	45		40	-35	-30	-25	-20	-15	-10		င်း	0	Oi .	10	15	(#)	DRIL	202	BOR	SITE
					هٔ م	-43.1	-38.1	-33.1	-28.1	-23.1	-18.1	1 .	<u>.</u>	81	3	19	6.9			DRIVE ELEV (ft)	DRILLER GOWER, SONNY	COLLAR ELEV.	BORING NO.	SITE DESCRIPTION
			1 1 1 1		n p p	53.8	48.8	43.8	38 8	33.8	28.8		သ သ အ	18.8	138	8.8	38			DEPTH (ft)	OWER	EV. 10.7	EB2-A	UPTION
				10		12	6	7	6	16	18	10		4	WOH I	2				0	, SONN	.7 ft	A	10N BRIDGE
				12		4	6	7	4	22	27	ô		7	W HOW	ω	N		***************************************	BLOW COUNT				GE NO.
-	Marie Property Designation		9	12		<u> </u>	3	6	0	26	32	4		<u> </u>	HOM	ω	4			0.5ft 0	STA	10	STA	3 €
					:: :			913:			: :::	:: ::			(0, 7.7.	6,		.			START DATE	TOTAL DEPTH	STATION 1	N-L-(N
				24		3	23				: : :	. /								BLOWS	TE 11/06/10		16+30	0N -L- (NC 99) OVER
					:::::					48					::::			.		PER FOOT	10	#		ER A CANAL
											: ::	:: ::					: :::			75 100	COMP. DA	NORTHING	OFFSET	COUNTY
-	Served Harris To			SS-8			 SS-7		88-6		SS-5		00-4	3	\$5.3	SS-2	SS-1		on was grant () A set / also y/) a marine	SAMP.			20 ft LT	BEAL
											19,1	with the second second second				119			(C) (PC - 1776) (C) (C) (C) (C) (C) (C) (C) (C) (C) (NO N	E 11/06/10	689,678		BEAUFORT
						00000	000000			1 , , ,		6 752 B 357 W	00000000	1 1 1						90-	Mud			
				49.6 Bo	46.3		رن د د		-26.3 GR SAT		-21.3	-16.3		6.3			61	10.7		ELEV. (ft)	SURFACE	EASTING	ALIGNMENT	GEOLOGIST
		1	Med	Boring Termin					GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)								UNDIVIDED COASTAL PLAIN GRAY AND BROWN SAND, MOIST TO SATURATED	ROADW		SOIL AND	WATER	2,702,1	NT -L-	ST FLO
			Jum Der	nated at I					OASTAL WITH SH YORKTO								JED CO. BROWN SATUR	OUND S		ROCK	DEPTH	17		
			nse Sand	Terminated at Elevation -49.6 ft in					PLAIN HELL FRAC								ASTAL PL SAND, MO	OUND SURFACE WAY EMBANKMENT		SOIL AND ROCK DESCRIPTION	H N/A	24 HR.	0	GROUND W
				49.6 ft lr					MENTS								OT TSIC	4		NOLL			0 HR.	CHESC
	ing stance and state the formation			60.3	57.0		47.0		2,9, 37.0		32.0	27.0		17.0			3.0	0.0		DEPTH (ft)	Automatic	: S	NA	GROUND WITR (ff)

NCDOT BORE DOUBLE B5201_GEO_BRDG.GPJ_NC_DOT.GDT_11/29/10

PROJECT REFERENCE NO. SHEET

7 OF 8

3				V																		
8-55	SS-7	55-6	SS-5	SS-4	SS-3	55-2	SS- 1	NO.	SAMPLE			SS- 18	SS- 17	SS- 16	SS- 15	SS- 14	SS- 13	SS- 12	SS-11	SS- 10	SS-9	NO.
20 LT	20 LT	20 LT	20 LT	20 LT	20 LT	20 LT	20 LT	0.00	つがながれて			18 LT	18 LT	18 LT	18 LT	18 LT	18 LT	18 LT	18 LT	18 LT	18 LT	OFFICE
16+30	16+30	16+30	16+30	16+30	16+30	16+30	16+30	C 2 2 2 2 C 4 Y	NOTE			15+75	15+75	15+75	15+75	15+75	15+75	15+75	15+75	15+75	15+75	STATION
58. 8-60. 3	48. 8- 50. 3	38. 8- 40. 3	28. 8- 30. 3	18.8-20.3	13.8-15.3	8.8-10.3	3.8-5.3	INTERVAL	DEPTH			73.7-75.2	68.7-70.2	58.7-60.2	48.7-50.2	38.7-40.2	33. 7- 35. 2	23. 7- 25. 2	13. 7- 15. 2	8.7-10.2	3.7-5.2	INTERVAL
A-2-4(0)	A-1-b(0)	A-2-4(0)	A-1-b(0)	A-3(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)	CLASS.	AASHTO	SOIL		A-3(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)	A- 1-b(0)	A-1-b(0)	A-3(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)	CLASS.
26	27	28	19	20	22	24	23	24.24.	7			24	22	25	27	24	19	20	21	21	27	4.4.
NP	4	6	NP	NP	NP	NP	NP	\$- \$-	ם ד	TE	and specialized interesting in the control of the c	NP	NP	NP	4	NP	NP	NP	NP	NP	NP	P.1.
54.0	60.3	47. 1	91.0	77.5	23. 5	10. 1	10.0	C.SAND		STR		25. 1	53.3	55.6	56.6	56.6	83. 1	62.5	23.6		10.9	C.SAND
32.9	18. 3	29.4	6.5	16.6	57.8	79.3	68.4	F.SAND	% BY	西公		67.0		32. 2	20.0	24.4	13. 9	29.4	56.8	78.9	70.0	F.SAND
7.1	10.3	9.4	1.5	1.8	6.7	4.5	8, 5	SILT	WEIGHT	ULTS	× :	4.8	6.9	5. 1	11.4	10.0	2.0	5,0	5, 5	4.7	9.1	SILT
6.0	11.1	14. 1	1.0	4.0	12. 1	6.0	13. 1	CLAY				3.0	7.1	7.1	12. 1	9.1	1.0	3.0	14. 1	8.1	10.1	CLAY
96	82	83	95	97	97	100	100	10	% PAL			100	89	97	92	87	95	90	96	100	100	10
71	46	54	22	54	87	98	99	40	PASSING (93	64	72	54	50	32	60	86	98	99	40
15	20	21	3	6	21	13	23	200	(SIEVES)			10	14	14	25	18	4	10	21	15	21	200
1	f	ı	I	1	1	L		MOISTURE	%			1	100 H	1		t	ľ	1	ı	1	1	MOISTURE
1	ı	ı	1	ı	1	ı	1	ORGANIC	%			ı	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1		ı	ı	ı	1	1	I	ORGANIC
								-														

				SOIL		TEST	ST R	BSULTS	TS						
SAMPLE	したからない	NOITATO	DEPTH	AASHTO	7 7	7	9	% BY 1	WEIGHT		% PAS	PASSING (S	(SIEVES)	%	%
NO.	CERDET	MOTITIES	INTERVAL	CLASS.	<i>u.u.</i>	hop im	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-9	18 LT	15+75	3.7-5.2	A-2-4(0)	27	NP	10.9	70.0	9. 1	10. 1	100	99	21	1	1
SS- 10	18 LT	15+75	8.7-10.2	A-2-4(0)	21	NP	8.3	78.9	4.7	8.1	100	98	15	1	1
SS- 11	18 LT	15+75	13. 7- 15. 2	A-2-4(0)	21	NP	23.6	56.8	5, 5	14. 1	96	86	21	ı	1
SS- 12	18 LT	15+75	23. 7-25. 2	A-3(0)	20	NP	62.5	29. 4	5,0	3.0	90	60	10	1	1
SS- 13	18 LT	15+75	33. 7-35. 2	A-1-b(0)	19	NP	83. 1	13. 9	2.0	1.0	95	32	4	ľ	ı
SS- 14	18 LT	15+75	38.7-40.2	A- 1-b(0)	24	NP	56.6	24. 4	10.0	9.1	87	50	18	ſ	1
SS- 15	18 LT	15+75	48.7-50.2	A-2-4(0)	27	4	56.6	20.0	11.4	12. 1	92	54	25	ı	1
SS- 16	18 LT	15+75	58. 7-60. 2	A-2-4(0)	25	NP	55.6	32. 2	5. 1	7.1	97	72	14	1	1
SS- 17	18 LT	15+75	68.7-70.2	A-2-4(0)	22	NP	53.3	32.8	6.9	7.1	- 89	64	14	l	1
SS- 18	18 LT	15+75	73.7-75.2	A-3(0)	24	NP	25. 1	67.0	4.8	3.0	100	93	10	1	1

SCOUR REPORT MELD

SHEET 8

DESCRIPTION(1):-BRIDGE-NO. 33 ON-L- (NC 99) OVER-A CANAL

WBS:

45299.1.1

IP:

B-5201

COUNTY: BEAUFORT

Extent(4): 10 FEET OUTSIDE BRIDGE Effectiveness(5): EFFECTIVE Obstructions(6): FALLEN TREES AND DEBRIS UPSTREAM IN CHANNEL
EXISTING SCOUR PROTECTION Type(3): WOODEN END WALLS AND WOODEN WING WALLS
Channel Bank: NONE NOTED
Channel Bed: NONE NOTED
Interior Bents: NONE NOTED
EVIDENCE OF SCOUR(2) Abutments or End Bent Slopes: NONE NOTED
Bridge No.: 33 Length: 36' Total Bents: 5 Bents in Channel: 3 Bents in Floodplain: 2 Foundation Type: TIMBER PILES
Information from: Field Inspection X Microfilm (reel pos:)
דעוסדוווס ספוקסד

INSTRUCTIONS

- Describe the specific site's location, including route number and body of water crossed.
- Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- CO Describe the channel bank material based on observation and/or samples. Include any lab results with report
- 0 Describe the material covering the banks (e.g. grass, trees, rip rap. none).
- 0 Determine the approximate floodplain width from field observation or a topographic map
- <u>/---</u> /---Describe the material covering the floodplain (e.g. grass, trees, crops).
- Use professional judgement to specify if the stream is degrading, aggrading, or static.
- Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- £ ₩ Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This
- bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics structures, other tests deemed appropriate, and overall geologic conditions at the site. Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring

								0
								Depth
								Offset
								Station
								AASHTO
		**					1.	PI
								F.
)	SS-1, SS-9	Channel Bank: SS-1, SS-9	Cha			Clay
de la constantina della consta			S-3, SS-11	Channel Bed: SS-3, SS-11	Che			Silt
				for samples:	for			Fine Sand
			is"	"Soil Test Results"	"So			Coarse Sand
				See Sheet 7.	See			Passed #200
	#10-12							Passed #40
	2000							Passed #10
					1			Retained #4
								Sample No.
								Ded of palik
		PIEKIAL	BANK WAI EKIAL	I BED AND	CHANNE	RESULIS FROM CHANNEL	S RESCE	SOIL ANALYSIS
		1						
					1, 2010.	ptember 2	ort dated Se	Hydraulics rep
Design Scour Elevations agree with the Hydraulic Unit's 100-yr contraction scour elevations proposed in the	ur elevations	action scor	00-yr contra	ulic Unit's 1	the Hydra	gree with	Elevations a	Design Scour
				ical scour:	nit theoreti	draulics Ur	of DSE to Hy	Comparison of DSE to Hydraulics Unit theoretical scour
						-4.4	CHANNEL BED	CHANN
						į		
97S	Meters	Feet X				TIONS(14)	UR ELEVA:	DESIGN SCOUR ELEVATIONS(14)
	AT							
						omments:	and Other C	Observations and Other Comments:
								(
				NELIZED	E - CHAN	(13): NON	n Tendency	r Channel Migration Tendency(13): NONE - CHANNELIZED
tic	Static	×	Degrading	9	Aggrading	(12):	Stream is(12):	
				TRUBS	SANDS		Floodplain Cover(11): IREES AND SHRUBS	71000
								1
					ROX. 500'	10): APPI	Floodplain Width(10): APPROX. 500'+	Floor
				HRUBS	TREES AND SHRUBS		Channel Bank Cover(9):	Channe
						II(o). OAIN	Cilalliel balk Material(8). SAND	Cildille
	= 0. , ;					1/8). SANI	Bank Materia	Channel
						1(7): SAN	Channel Bed Material(7): SAND	Channe
		E	CKNA	DESIGN INFORMATION				
		5	OBAT		7			

Reported by:

Tyler Bottoms

Date: 11/29/2010

Template Revised 02/07/06